

estimate of the number and thickness of the Lias and Jura deposits to be too great. In spite of Pilcher's care in selecting a traverse apparently free from complications, Wöhner contends that thrusting and over-folding have produced a repetition of the beds.

In the chapter on stratigraphy, each member is dealt with in order. Incidentally, several points of interest are raised, such as the discovery in the Weisser Riffkalk of a true Coralline, to which the name *Cheilosporites Tirolensis* (Wöhner) is assigned on account of its affinities with the modern *Cheilosporum*; there is also a doubtful Hydrozoan which more nearly resembles the Palæozoic Stromatoporoids than the Upper Jurassic Ellipsachinias and Sphæractinias, but is none the less morphologically nearest to the Triassic Spongiomorphidæ. Calcareous algæ, hydrozoa and corals contribute to the up-building of the reefs, but Dr. Wöhner finds the last-named organisms predominating.

The greatest interest attaches to the "Radiolariengesteine" and the "Hornstein-Breccie." Dr. Wöhner, in common with his predecessors, had been accustomed to regard the structure of this area as being far simpler than he now finds it. He demonstrates a large amount of thrusting and folding ("Aufwölbung"), the greater part of the movement having acted about the Hornstein-Breccie, the rocks above being comparatively little influenced. On all sides there are signs of pressure—brecciation, suture structure—and the term "Druckbreccien" is suggested as an expansion of Brögger's "Breccias in situ" for this widespread occurrence. The Hornstein-Breccie is proved to be a true "dislocation-breccia," and to contain blocks both of older and younger rocks.

In his anxiety to leave no doubt as to the tectonic origin of this breccia, the author appears to have somewhat laboured certain points that seemed to tell in his favour; for instance, he insists on the abyssal character of the over- and under-lying rocks because of the abundance of Radiolaria in them, especially the occurrence of a few Nassellarian forms—an argument that is not very safe, nor, in view of the other good evidence, is it very necessary. Again, the statement that the cloudy centres of some calcite crystals in the more or less marmorised limestones represent the finest powder of the crushed rock may be quite correct; but the same thing may be observed in semi-crystalline limestones of various ages, which have suffered no such considerable crushing, though it is true that the crystals more often exclude the impurities during their growth.

The author and his supporters, the *Gesellschaft z. Förderung deutscher Wissenschaft, Kunst, u. Literatur in Böhmen*, may be congratulated on the production of an excellent piece of work. The continuation will be looked for with interest; it is to be hoped that Dr. Wöhner, in addition to the half-promised geological map, will also furnish a series of photomicrographs of the numerous rock-sections he has examined.

J. A. H.

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#### SHERBORN'S INDEX ANIMALIUM.

*Index Animalium sive Index nominum quæ ab A.D. MDCLVIII generibus et speciebus animalium imposita sunt, Societatibus Eruditorum adjuvantibus, a Carolo Davies Sherborn confectus. Sectio prima, a kalendis Januariis MDCLVIII usque ad finem Decembris MDCCC, Cantabrigiæ. E. typographico Academico MDCCCII.* 1 vol. Pp. lix + 1195. (Cambridge: University Press, 1902.) Price 25s. net.

DARWIN was so convinced of the pressing want of a dictionary of the names of plants that he devoted by his will a considerable sum of money to be employed in compiling such a work. This gigantic task, which was completed in 1895 by Mr. B. Daydon Jackson, and published by the University of Oxford under the title of "Index Kewensis," has been of enormous utility to working botanists. It was obvious that our zoologists would not be content without a similar convenience in their branch of natural science, and in 1890, accordingly, Mr. C. Davies Sherborn commenced his labours on the present work. His scheme for its preparation was set out in a letter published in this journal (*NATURE*, vol. xlii. p. 54, May 15, 1890) and in "La Feuille des Jeunes Naturalistes," and suggestions for the improvement of the plan were at the same time invited from many working naturalists. After these had been studied, the scope of the proposed "Index Animalium" was finally defined as follows:—

(1) To provide a complete list of all the generic and specific names that have been applied to animals since January 1, 1758, when Linnæus inaugurated the binomial system.

(2) To give, as far as possible, an exact date for every quotation of a name.

(3) To give a reference to every name sufficiently exact to be intelligible to the specialist and the layman, so that they may know where to look for it.

Mr. Sherborn commenced regular work on July 1, 1890. After two years, an unfortunate breakdown in health, which interrupted more than once his assiduous labours, caused him to lose altogether three years, so that the actual time spent on the preparation of the present volume has been about eight years.

In 1892, the importance of the work was brought to the knowledge of the British Association, and a committee was appointed to assist its progress. The late Sir William Flower was its chairman, and Dr. Sclater, Dr. Henry Woodward and Mr. W. L. Sclater were other members. The committee has been reappointed every year, Dr. Woodward succeeding Sir W. Flower as chairman, and Dr. F. A. Bather becoming secretary when Mr. W. L. Sclater went abroad. The British Association has consistently supported the finances of the committee, and valuable contributions have been received from the Zoological Society of London and from the Government-grant fund of the Royal Society. Great assistance to the work has also been furnished by the permission of the authorities of the Natural History Museum to find storage and cabinets for the MS. of the work in the library at South Kensington, where the author has carried on most of his labours.

In 1897, in pursuance of a suggestion made by Dr.

Sclater, it was determined by the committee that in view of the long time that must elapse before the completion of the whole work, it should be divided into three portions—the first to contain names given from the beginning of 1758 to the end of 1800, the second those given from 1801 to 1850 inclusive, and the third those published in the latter half of the last century. We have now, therefore, before us the first of these three portions, from 1758 to 1800 inclusive. It is contained in one volume of 1195 closely printed pages, with about fifty-eight names in each page.

As the Clarendon Press had published the "Index Kewensis," it was supposed that the University of Oxford would gladly undertake the present work, and the first offer of it was made to Oxford. It was found, however, that such stringent terms were required there as could not be acceded to, and the sister University, being more liberally disposed, has thus obtained the honour of introducing to science the "Index Zoologicus."

#### OUR BOOK SHELF.

##### *Vergleichende chemische Physiologie der niederen Tiere.*

By Dr. Otto von Fürth, Privatdocent and Assistant in the Chemico-physiological Institute of the University of Strassburg. Pp. xiv + 670. (Jena: Gustav Fischer, 1902.) Price 16 marks.

DR. OTTO V. FÜRTH has shown himself one of the ablest of the younger workers in the subject of chemical physiology, and he is already well known for his admirable researches on the subject of muscle-plasma and the chemistry of the suprarenal capsules. He has also contributed to physiological journals several interesting papers on the chemistry of invertebrates, which he has investigated during a stay at the zoological station at Naples. During his residence there, he appears to have inhaled with the sea breezes the proper invertebrate atmosphere for the carrying into execution of the present ambitious volume. Although the book is entitled the "Chemical Physiology of the Lower Animals," it relates mainly to the invertebrates, and at the end of each chapter is a brief summary contrasting these with the Vertebrata. Vertebrate physiology is fairly fully treated in all text-books of human physiology, and so the book meets what was a distinct want. Max Verworn, it is true, in his "General Physiology" approaches the subject by the study of the cell and of simple organisms, but the ground covered by v. Fürth's book is quite distinct from this.

The general scope of the book may be indicated by a brief enumeration of the subjects treated. After a few general chapters on the chemistry of the compounds met with in the animal kingdom and on the chemical composition of protoplasm, the first main heading is the blood, and this fluid in echinoderms, worms, molluscs, crustaceans, insects and tunicates is described. Breathing, nutrition and excretion are then treated under similar headings. Then the various animal poisons, and special secretions like mucin, the ink of cephalopods, silk, wax, &c., are described. The skeletal tissues, the pigments and the muscular tissues form the subjects of the next chapters, and at the end is an account of the genital secretions, under which, *inter alia*, a description of Loeb's experiments on artificial parthenogenesis is given.

It may be a matter of surprise to many well-informed physiologists what a large mass of material existed in relation to what has been regarded as the comparatively neglected subject of invertebrate physiology, and what interesting reading it makes when collected into an organic whole. Another general reflection will be what

a vast field for research is still open to fill up the gaps in our knowledge.

The diligence the author has evinced in writing his book is beyond all praise. His lists of bibliographical references will prove most useful to future students of this branch of science. Unlike many of his countrymen, he has consulted, not only those papers which are written in his own language, but he has been cosmopolitan in his reading. His aim, as just stated, has been an ambitious one, and we congratulate him most heartily on a decided success.

*Thermodynamique et Chimie. Leçons élémentaires à l'usage des Chimistes.* Par P. Duhem. Pp. ix + 496. (Paris: A. Hermann, 1902.) Price 12s.

THE second law of thermodynamics has had a curious history. It originated out of attempts to estimate the motive power of fire, it subsequently led to the notion of the thermodynamical potential, this in turn gave birth to the phase rule, and now it is in the domain of chemistry that the law obtains its most fertile applications. Prof. Duhem has already published a treatise in four volumes on thermodynamic chemistry, which has been reviewed in these columns ("Traité élémentaire de Mécanique chimique fondée sur le Thermodynamique." Paris, 1897-99), but a demand has arisen among chemists for a more elementary treatise, assuming but little knowledge of mathematics. As the author points out, the philosopher, the mathematician, the physicist and the chemist—he might have added the engineer—require separate treatises on thermodynamics.

Prof. Duhem confines himself to "three-day methods," that is, to methods formerly included in the syllabus of the first three days of the Cambridge Tripos—or, in other words, he uses neither calculus nor coordinate geometry, unless graphical representations are regarded as implying coordinate geometry. After an elementary introduction to the properties of the thermodynamic potential, he considers the phase rule, the properties of invariant, univariant, bivariant and multivariant systems, the displacement of the equilibrium state for variations of temperature and pressure, the properties of perfect gases, and the dynamics of false equilibria and explosions. The work appears to afford an excellent account of the large field of chemical investigation first started by Gibbs, Moutier and others which has led to such important results in the hands of van der Waals, Bakhuis Roozboom, van 't Hoff, Sainte Claire Deville, and a large army of still more recent workers.

G. H. B.

*Das Problem der geschlechtsbestimmenden Ursachen.* By Dr. M. von Lenhossék, Professor of Anatomy in the University of Budapest. Pp. 99; 2 figs. (Jena: Gustav Fischer, 1903, published 1902.) Price 2 marks.

PROF. M. VON LENHOSSÉK gives us an admirably clear and scientific deliverance on the much-discussed problem of the factors which determine the sex of offspring. He takes account of most of the data and most of the theories, and comes to the conclusion that the determination is in the hands of the maternal parent and that the decision is given *prior to fertilisation*. He does not seem even to allow—what seems to us almost proved by the experiments of Yung and others—that the original bias may be altered in early stages of development. We adhere to the eclectic position that the determination of sex depends upon numerous variable factors, operative before, in and after fertilisation. The author's references to the literature on the subject are so numerous that we may point out the omission of any recognition of Starkweather, Hensen, Geddes and Thomson, Henneberg, Beard and Van Lint. J. A. T.